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ABSTRACT

Results of an attitude survey concerning the impact of quantification trends on the administration of higher education and guidelines for administrators are presented. Sixty-three academic deans from eight midwestern institutions responded to 12 survey statements describing possible relationships between quantification and selected administrative duties. Results indicated that relevance is a problem in regard to quantification methods being used on campuses. Additionally, familiarity with institutional research activities was an inverse indicator of future support for increased uses of quantification. Guidelines on the uses of quantification tools cover the following areas: investigating the purpose of the tool, selecting the appropriate tool, understanding the specialist, understanding the data transformation, focusing on planning, and searching for quantifiability. (SW)

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THE ASSOCIATION FOR INSTITUTIONAL RESEARCH

This paper was presented at the Twentieth Annual Forum of the Association for Institutional Research held at the Peachtree Plaza Hotel in Atlanta, Georgia, April 27 - May 1, 1980. This paper was reviewed by the AIR Forum Publications Committee and was judged to be of high quality and of interest to others concerned with the research of higher education. It has therefore been selected to be included in the ERIC Collection of Forum papers.

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ABSTRACT

Of all the goals that institutional researchers might set for themselves for the 1980's, there are at least two items of unfinished business that deserve continued attention: credibility and relevance. An attitudinal study involving 63 midwestern academic deans indicated that relevance was still a problem and that familiarity with institutional research activities was an inverse indicator of future support for increased uses of quantification.

This paper presents some of the findings of a study of Class IIA institutions in eight midwestern states, summarizes some earlier studies, and suggests some guidelines to help administrators make the most of the ambient quantification levels at their institutions.

IS ANYONE OUT THERE LISTENING?

Higher education reflects society in many ways. Not the least of these is in the increasing attention given to technique. By technique, in this context, we mean the use of paradigms (or algorithms, or formulas) driven by quantification and used as tools in the administrative process. Some well known examples in higher education are formula funding, most educational outcomes, discipline productivity, certain aspects of faculty evaluation, and in general those processes by which endeavors that have qualitative aspects are digitized and ranked.

The fact that the application of these techniques is a resource-intensive operation establishes a need to understand the process and to investigate the level of impact. There are important differences among (1) cataloging the existence of tools, (2) recording the level of use of tools, and (3) evaluating the actual impact of tools. Further, there is considerable opinion that the impact of using these tools is increasing. But, does central administration actually listen to this quantified advice? Perhaps these tools are used mainly as vehicles to achieve other changes, or as convenient surrogates for less defensible decision-making processes? Is quantification an easy train ride that stops short of the goal and leaves the administrator with only rusted and unfamiliar tools for the balance of the journey?

Of all the goals that institutional researchers might set for themselves for the 1980's, there are at least two items of unfinished business that deserve continued attention: credibility and relevance. This paper considers the basic questions (1) What is the level of impact of quantification?, and (2) Is there a recognized shift of trends in this impact? These questions are addressed primarily through an attitudinal survey of academic deans.

Background

Many others have identified these trends, spoken to the level of impact, and speculated on the transfer of power. Glenny (1972) wrote of the 'anonymous leaders of higher education' and Wyatt and Seckhauser (1975) labeled these leaders 'interpreters'. Adams, Hankins, and Schroeder (1978) were concerned about technologists who perceive a poorly defined need, and Bowen (1977) noted that "Statistics are no substitute for judgement". Perlman (1974) accused institutional research of collecting only what it can quantify, thereby ending up with precise information about the irrelevant.

Earlier studies have made important contributions in this area. Rourke and Brooks (1966) posed the questions that remain relevant and unanswered, (1) "Are colleges and universities making different kinds of decisions from those they once did as a result of the new management techniques available to them? and (2) Have the innovations in management brought important shifts in control over decision-making in colleges and universities in this country?" Mann, Thomas, Williams, and Willhaus (1975) catalogued important increases in centralization and managerial decision-making in their study. Mowshowitz (1976) considered the corporate structure and found the precise form of the effect "difficult to ascertain." He identified a supply/push affect of the technical products in the marketplace and noted that a demand/pull might tie the tools closer to the decision-making process.

Riley and Baldridge (1977) published an important longitudinal study but the focus remained on the line administrators and did not address the staff whose affects often cut across this chain of command. The 'interpreter' of Wyatt and Zeckhauser (1975) stands between the MIS operation and the top level administrators. One of the results of that study focused on the need to keep

these interpreters in tune with the system if success is to be achieved.

Stamen (1979) commented on this shifting of power by noting that, "Managers must be aware of the centralizing tendency created by readily available information. As operations - related information becomes accessible, presidents and vice presidents may be tempted to become involved in decision-making best left to deans and directors." The recent capability of the central administration to manipulate data at very low levels of aggregation has spurred attempts to mechanize the process of decision-making. This access to timely and detailed information nestled several layers deep into the organizational structure may influence administrators to extend their direct control.

Research Design

Various administrative positions were considered in a search for a method to measure the impact of such quantification on the administration of higher education. The position of the academic dean seemed to be somewhere near that interface between the quantitative products of management and the qualitative arguments normally found within the schools and colleges. Other administrative positions appeared to be less well defined across institutional boundaries or were more completely immersed in either the numerical vehicles of management or in the unmeasured environment of the academic departments.

A survey was distributed to the academic deans of the AAUP Class IIA institutions in eight midwestern states.

Three types of impact were investigated.

(1) The erosion of power: When some information becomes generally available and some algorithm provides an acceptable ranking of alternatives, then no power remains to make a decision - it has already been made by the process itself and waits only to be ratified. The gain in power by one group

(say the trustees) may not equal the loss of power by another group (say the faculty). This erosion of power may be due to the presence of a tool which provides a quantified description of events.

(2) The shift of power: It may be that the loss of power mentioned above can be considered as a transfer to a third group. Perhaps this power now resides with those who control the technique, those who prepare the algorithms, and those who generate the data that drive the algorithms. If this is true, then power has shifted to managers, not administrators, and to positions of staff, not of line.

(3) The vertical range of power: Today, central administration has at its fingertips all the quantitative information available to each department chairperson. And since qualitative information tends to generate protracted discussions, central administration may come to feel it has all the important decision-making information. A natural step is for central administration to assume many of the decision-making roles once reserved for deans and chairpersons.

The survey instrument consisted of four statements for each of the three types of impact described. Each statement presented a direct relationship between some administrative activity and some quantified process. For example:

My office is pressured to recommend actions that support the available data in spite of the existence of strong but unquantifiable factors.

	disagree			agree
1	2	3	4	5

This situation was less true __, the same __, more true __, five years ago.

Will this trend continue? yes ___, no ___

Should this trend continue? yes ___, no ___

The Likert-type scale was provided for the respondent to indicate his level of agreement with the statement. The request for trend information was included in an attempt to identify the extent of support from the academic community. Institutional characteristics were also gathered for a broader analysis.

Results

Sixty-three academic deans provided their opinions concerning the levels of agreement with the twelve survey statements describing possible relationships between quantification and selected administrative duties. The aggregate responses are shown in Table 1. These responses can best be described as moderate. Accompanying each statement was a request to indicate the presence of a trend in the level of impact for the described relationship during the last five years. A summary of the responses to these requests is shown in Table 2. A further summary of Table 2 shows that 54% of the respondents reported no trend in the levels of relationship to quantification during this period. However, those 46% who reported trends, reported increasing trends by a 3:1 ratio. This ratio of increasing trends covered the historical period, the expectation of a future increasing trend, and support for that future increasing trend. When the survey responses were considered without subdivision, the reported level of impact was moderate but those reporting trends heavily expected and supported future increases.

A more detailed description of the average level of impact and of the trends relationships expressed as ratios is shown in Table 3.

When the sample was subdivided by level of agreement with the survey statements, several definite relationships were noticed. The low group consisted of those respondents showing little or no agreement and the high group

were those showing moderate to complete agreement. The comparisons are reported in Table 4.

The low impact group would appear to be tomorrow's quantifiers. That is - the low group reported less impact (by definition), - the low group reported three times the ratio of increasing trends, - the low group reported three times the expectation of future increasing trends, and - the low group supported these increasing trends by a 1.5:1 ratio over the high impact group. It seems appropriate to characterize the group that reported the lower levels of impact as being less aware of trends but much more prone to expect future increases and to support those increases. It is tempting to infer that the low response group is in an earlier (not necessarily more primitive) stage of development and at this time senses a source of help from quantification that perhaps has not been realized by those reporting a greater current level of impact. That is, the sense of anticipation in those reporting little relationship may be surfacing as a sense of frustration in those already experiencing the relationship.

Subdivisions by institutional characteristics presented a variety of relationships. Perhaps the most interesting by comparison were the results based on the existence of an institutional research office and the existence of a planning office.

The presence of an institutional research office was accompanied by consistent reports of - greater impact, - more identified trends, - greater ratios of increasing trends, and - greater tie to quantification. And, in interesting contrast, there was a recognizable trend in these same institutions to see less of a future trend and to show less support for that trend than in those institutions without such an office.

The planning office and institutional research are often closely related. However, the survey results showed that 13 of the 18 ratios describing these offices established reverse results. The reported tie between quantification and the planning office was greatly reduced from the institutional research example and implied a significantly different relationship as well as a different role for these two offices.

The final subdivision focused on the collected responses of the individual academic deans. It is interesting to note that many of the relationships that were clear when based on other subdivisions were not obvious when each dean was summarized as an individual. By this we mean that there were very few significant rank correlations between institutional characteristics and the collected responses of the individual deans. It may be that the responses of the deans are more related to the nature of the individual than to the institutional characteristics surrounding them.

Conclusions

The following major points reported by the survey should be reemphasized:

- a 3:1 ratio of increasing trends to decreasing trends.
- a 2.6 average response (on a scale of 5) indicated a moderate level of agreement with the survey statements.
- there was an inverse relationship between experiencing a higher level of impact and supporting a higher level of impact.
- reports of lower exposure to quantification were almost invariably accompanied by expectations of future increases and support for those increases in those cases when trends were present.
- the presence of an institutional research office was accompanied by reports of higher impact and less support for future impact.

- the presence of a planning office was accompanied by reports of less impact and greater support for increased quantification.
- though virtually all subdivisions based on institutional characteristics indicated distinctive relationships, such relationships were not visible when the data were analyzed by individual respondent.

Guidelines

If institutional research and the role of quantification are ever to be allowed to achieve their full roles in the administration of higher education, it is necessary that administrators be counseled in the uses of these tools. The tie to decision-making remains elusive (i.e., relevance). Direct relationships between given items and their quantified descriptors are often unclear (i.e., credibility). Every effort must be made to encourage the administrator to look for assistance, to participate in the process, and to ask questions until the process is understood. Some guidelines are provided toward these ends.

"Defensive Driving" might describe this collection, i.e., don't abandon the tool, keep an eye on the other drivers, and try to maintain a balance between driving and being driven.

a. Investigate the purpose of the tool.

Making no pretense to futurology, it seems accurate to say that quantification will be here as long as we are here. Given the truth of that statement it is also clear that the existence of the tool guarantees that some will make use of it. As was once remarked, "give a boy a hammer, and he will straightway discover that everything needs hammering." This situation demands that the tool be understood if for no other reason than to defend against it. However, such familiarity may uncover beneficial purposes. These should not be discarded.

b. Select the appropriate tool.

Given that there is some utility in the process, it is important to shape the tool to the hand, and not to redesign the hand. Failure to drive the technology and instead to be driven, is close to the heart of the difficulty. Administrators are busy people. They often share in the control of personnel allotments. If an administrator wants a new tool he may hire a middle-manager to develop it and soon the project has a life of its own. The availability of data shapes the output. Standard paper widths directly affect the amount of information presented. Machine configurations and storage mechanisms affect system design. Most administrators want results, not questions. One result of these influences is that most administrators see a finished package placed before them with a level of effort that is computed in man-years, and with an associated price tag requiring all involved to sign-off on its utility. Once again, the hand is molded to the tool.

c. Understand the specialist.

The administrator has abandoned his role as designer partly through preoccupation with other duties, but largely because tool development is judged to be 'lower level' work and because the new profession of 'quantifier' appears scientific and exclusive. We are all familiar with the statement, "I don't understand the numbers, that's why I have an assistant." This transfer of power is a major hinderance to tieing the process to decision-making. Institutional research must not exercise power only because its mechanisms are not readily decipherable to the academic administrator.

d. Understand the data transformation.

In our cultural eagerness to quantify we tend to forget a lesson learned by cartographers some years ago: that you can't map a 3-dimensional object

onto a 2-dimensional surface without distortions. Clearly, education is a multi-dimensional effort. Thurston Manning, of the North Central Association, has noted the following:

- data are usually correct in some respects, and usually misleading in others.
- it is important to know, before collecting data, which measures we wish to preserve.
- all data are only surrogates in our concern for quality.
- we look at quantity because we can't comprehend quality.
- use as many independent measures of quality as are available, since redundancy is critical.

It is not surprising that the designers of these tools do not dwell on the possible distortions of the transformations.

There is much incentive to extend our knowledge of higher education administration and the condition is probably analogous to Bertrand Russell's comments about physics - 'Physics is mathematical not because we know so much about physics, but so little.' If quantification could be looked upon as a cartographer's device to help us temporarily visualize the situation until we learn enough about it to be able to discard the surrogate, then we might find a constructive place for quantification and also a criterion for abandoning it.

e. Focus on planning.

Technique forces definitions. The fact that the definitions sometimes don't define and that the information systems built on them are sometimes ineffectual, is not the entire story. The act of planning, of debating definitions, of building fences that fail to divide, can all be constructive activities. The cost is great but so are the benefits. Perhaps the attempts

at quantification have tangential benefits. Perhaps the existing activity can serve useful purposes in addition to the designed purpose. The claim that such efforts at planning would be expended independently of the pressure of tool design is not convincing. Clearly, such a design should not be pursued solely for this purpose, but the seeming inevitability of such activities should be used to advantage wherever possible.

f. Search for quantifiability.

Some fences really do divide, and really do reduce the range of possible correct decisions. We should search for those that include acceptable minimal levels of distortion. Surely we do not preserve our uniqueness nor our humanity by failing to recognize the existing mechanisms in our society. A cue could be taken from Vonnegut's society and assign machines to those tasks that are felt to be below us. However, we fear that technology will embrace our most human tasks. Since technology is taking over some tasks we feel are important, it should be a warning to us that we may have placed importance in some mechanical activities. Perhaps we should relegate all mechanical operations to a lower level of importance. If it can be automated, so be it. Let us use that fact as a criterion for reclassifying the importance of the activity.

Summary

Higher education is experiencing a discontinuity between the application of the tool and the decision-making process. Top management has recognized a need for information. This need has been combined with a willingness to let middle-management design the tool. As central administration reassumes its leadership role in the development of these techniques we can expect improved goal directed systems. It may even be that such familiarity with the design

of the product will result in broader utility and impact of these systems.

The moderate relationships identified by this survey and the majority response of 'no recognizable trend' should reinforce our resolve to tie the tool to the decision-making process. The inverse relationship between experiencing the impact of quantification and supporting future increases in quantification should remind us that as entrepreneurs we have been less than successful. There remains adequate opportunities to design useful products for recognized tools in a manner that supports the existing qualitative procedures. An increased emphasis of the complementary natures of these two types of procedures is indicated.

Table 1. Average Levels of Agreement with the Three Types of Impact

	Level of Agreement (1 2 3 4 5)	
Erosion of Power		2.5 (SD = 1.2)
Shift of Power		2.4 (SD = 1.4)
Range of Power		2.9 (SD = 1.5)

Table 2. Total Responses to Trend Reports Over the Last Five Years

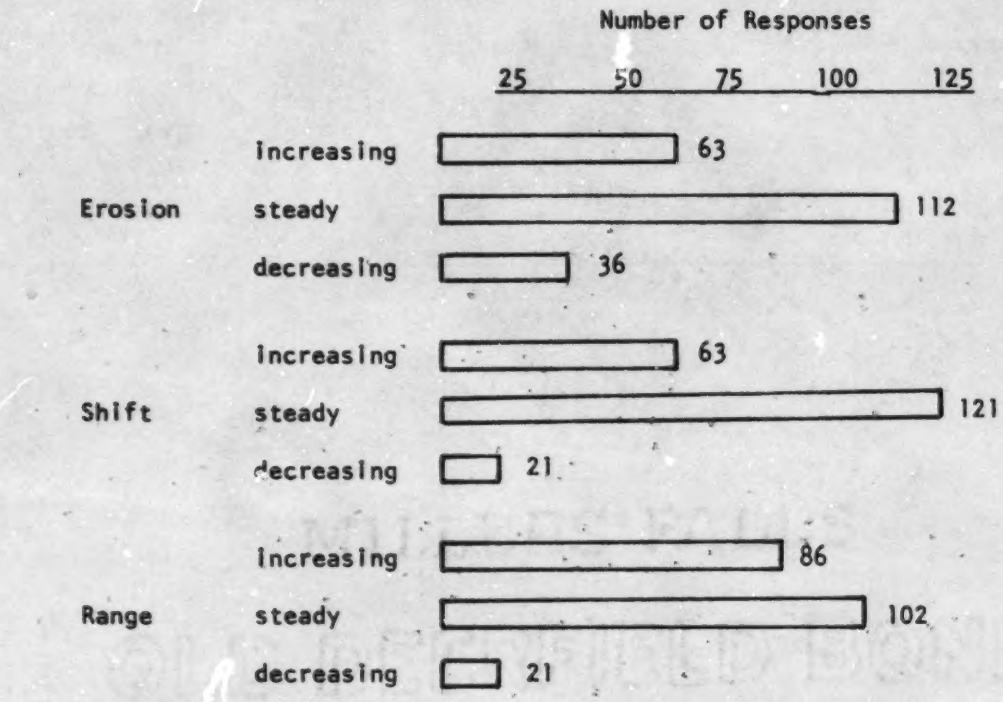

Table 3. Agreement and Trend Response for the Three Types of Impact

Conditions	Erosion	Shift	Range
level of agreement with survey statement (ave.)	2.5	2.4	2.9
% reporting some historical trend	46	41	51
Of those reporting an historical trend, the ratio of increasing to decreasing	2.0:1	3.0:1	4.1:1
Of those expecting a future trend, the ratio of increasing to decreasing	2.3:1	3.6:1	3.8:1
Of those supporting a future trend, ratio of increasing to decreasing	1.8:1	1.6:1	1.8:1

Table 4. Impact Comparison by Level of Response

Conditions	Low group	High group	Ratio low:high
% reporting some historical trend	36	59	0.6:1
Of those reporting an historical trend, the ratio of increasing to decreasing	3.8:1	1.3:1	3.0:1
Of those expecting a future trend, the ratio of increasing to decreasing	4.7:1	1.5:1	3.1:1
Of those supporting a future trend, ratio of increasing to decreasing	2.3:1	1.6:1	1.5:1

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